

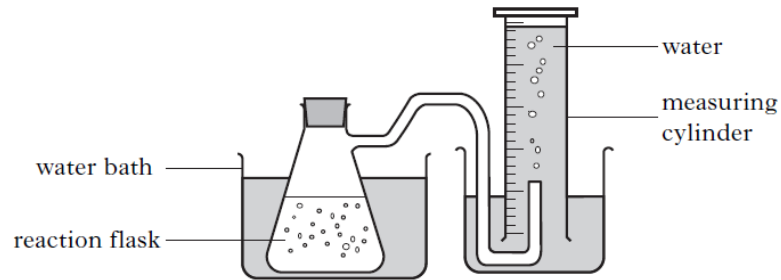
Biology National 4 Homework "Respiration"

1. An investigation was carried out into the effect of temperature on the rate of respiration by yeast. Marks

1. contd.

Details of the apparatus, method used and results are given below.

Apparatus



Method

- 1 Water baths were set up over a range of temperatures.
- 2 100 cm³ of glucose solution and 50 cm³ of yeast suspension were allowed to reach the same temperature as the water bath.
- 3 The glucose solution and the yeast suspension were mixed in the reaction flask.
- 4 After 1 hour, the volume of gas in the measuring cylinder was measured.

Results

<i>Temperature</i>	(°C)	10	20	30	40	50
<i>Volume of gas produced in 1 hour</i>	(cm ³)	9	18	36	48	5

(a) Ethanol was formed in the reaction flask.

What cell process produced this?

1

(b) Describe the relationship between the temperature and the volume of gas produced in one hour.

2

(c) Predict the volume of gas which would be collected in one hour if the investigation was repeated at 60°C. Give an explanation for your answer.

Prediction _____ cm³

1

Explanation _____

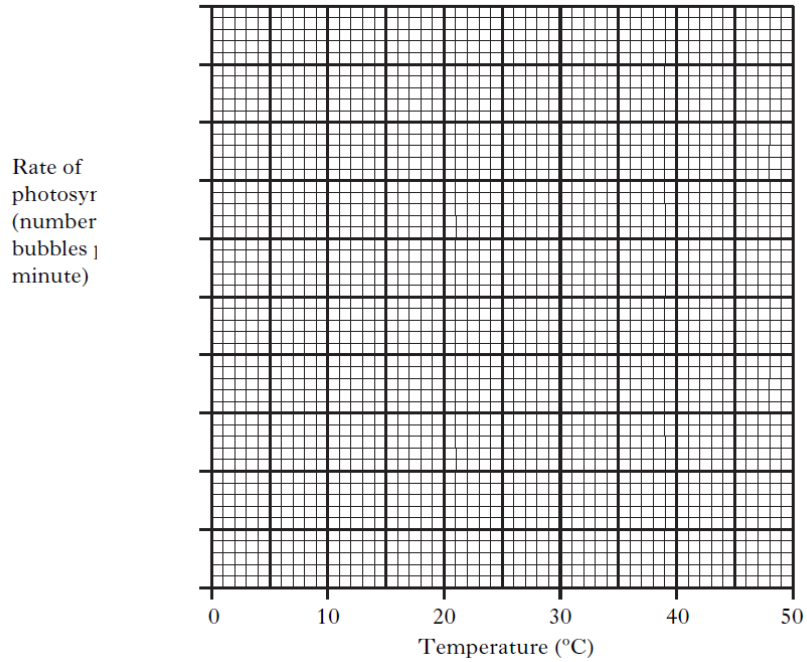
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(d) Describe the control flasks that would be set up to show that the gas was produced due to activity of the yeast and to no other factor.

2

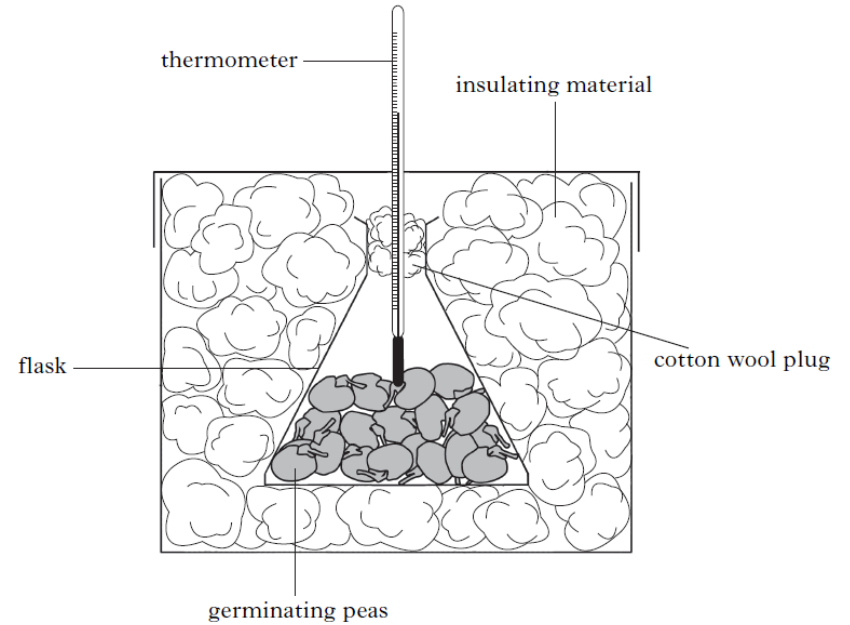
Biology National 4 Homework "Respiration"

1. contd. (e) Use the results to complete a line graph to show the volumes of gas produced in one hour over the range of temperatures.



2

2. The diagram below shows apparatus used to investigate heat production by germinating peas.



- (a) (i) Which gas, needed by the germinating peas, will pass through the cotton wool plug?

1

- (ii) There was a 2°C rise in temperature inside the flask after 24 hours. What biological process caused this increase?

1

- (iii) Why is it important that the flask is surrounded by insulating material?

1

Biology National 4 Homework "Respiration"

2. contd.

(b) Give **one** reason why living cells need energy.

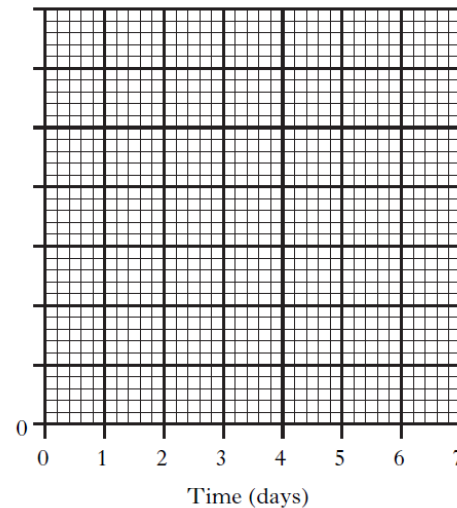
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(c) The results of the investigation are shown in the table below.

<i>Time</i> (days)	<i>Rise in temperature</i> (°C)
0	0.0
1	0.2
2	2.0
3	4.0
4	5.0
5	5.4
6	5.6
7	5.6

2. contd. Use the results to complete the line graph by:

- (i) completing the scale on the y axis; 1
- (ii) adding a label to the y axis; 1
- (iii) plotting the graph. 1



End of homework questions.